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ABSTRACT

This instructional unit about environment and socioeconomic development in India is a supplement to the publication "Environmental Education Curriculum Infusion Units for Grades 7-12," ED 137 056. This specific unit is designed to increase students' understanding of Indian society and traditions as they relate to global problems and to help students identify the environmental concerns of a developing nation. A brief introduction suggests instructional strategies including comparison of information about India and other nations; an inductive learning approach using photographs as the basis for hypothesis and research; and lessons based on single concepts such as underemployment. Five "topic chapters" comprise the main part of the document. Each chapter identifies specific objectives (such as illustrating the diversity of Indian lifestyle), provides background information through readings and photographs, poses a problem for discussion, suggests questions and activities, and lists related resources. The five chapters discuss the problems of sharing one planet, India's geography and people, population problems, industrialization in a developing country, and meeting human needs. The units encourage students to discuss issues such as allocation of funds for industrial progress versus agricultural development. (AV)

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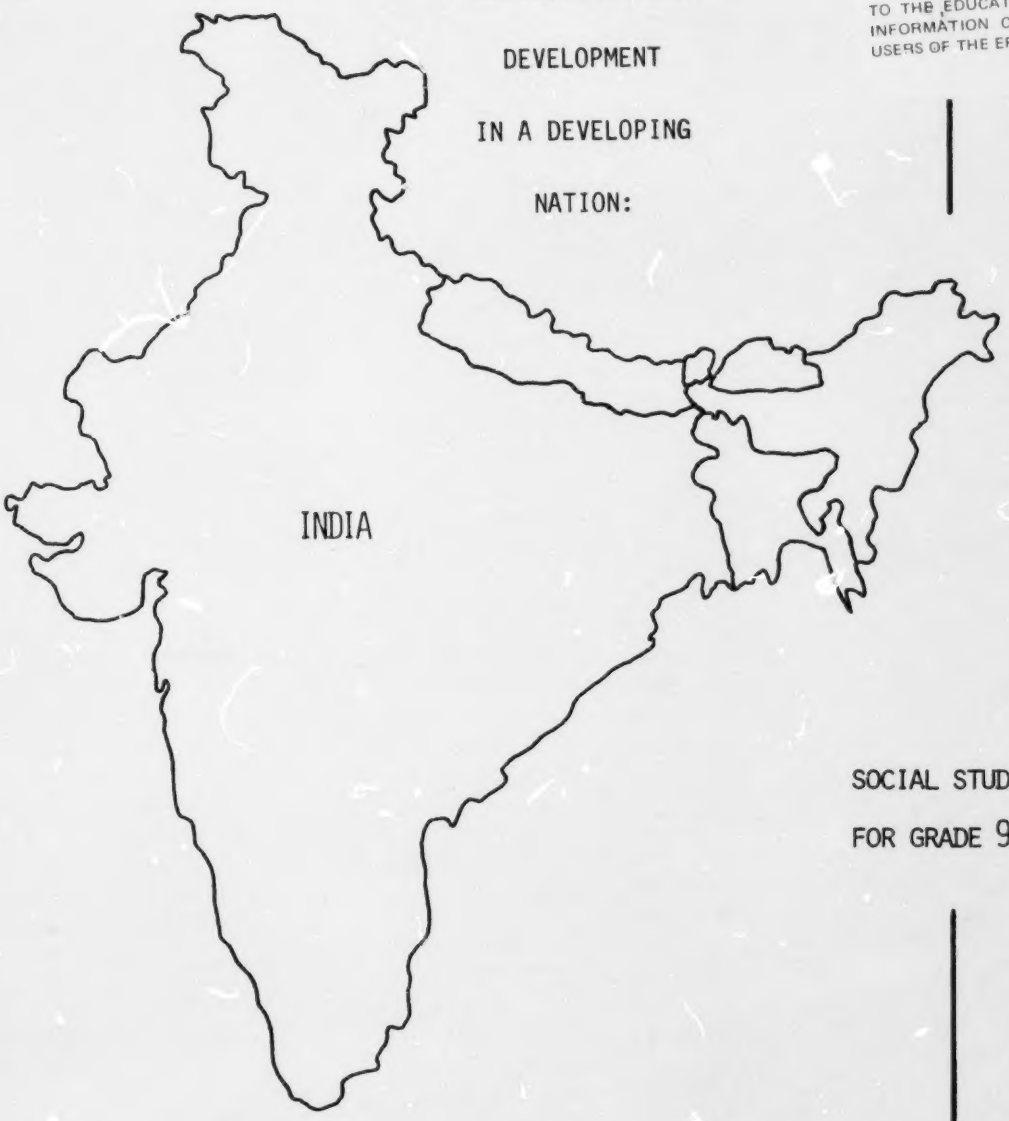
ENVIRONMENT AND DEVELOPMENT IN A DEVELOPING NATION:



SOCIAL STUDIES

FOR GRADE 9

The University of The State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of General Education Curriculum Development
Albany, New York 12234

FOREWORD

This instructional supplement is an addition to the publication Environmental Education Curriculum Infusion Units for grades 7-12 which was distributed to schools two years ago. The unit, dealing as it does with environment and socio-economic development in India, is another example of subject area material which has been infused with environmental objectives, concepts, and activities. In this instance, use of the material would be appropriate in conjunction with the related content implied by the understandings and generalizations in Social Studies, Grade 9: Asian and African Culture Studies.

The unit was developed by a team of specialists in environmental education selected by the Department's Center for International Programs.

The team consisted of Barry Jamason, the Department's coordinator of environmental education; William Aylward, chairman of the social studies department in the Farnsworth Middle School, Guilderland and mayor of the Village of Altamont, New York, who has been especially active in developing environmental study activities in his school and local community; and Stanley Wecker, Associate Professor of Biology at The City College of The City University of New York and formerly staff ecologist to the Environmental Education-Community-Opportunity for Stewardship Project of the Board of Cooperative Educational Services of Northern Westchester and Putnam Counties. Aylward and Wecker participated as consultants on environmental education to the Department.

The team attended the United Nations Conference on the Human Environment in Stockholm and participated in the Environmental Forum, a conference of non governmental representatives and organizations which paralleled the official governmental conference. This United Nations conference brought together from all parts of the world persons interested in the study, in schools and colleges, of problems of the environment.

From Sweden, the team members proceeded to India, where they worked at the State Education Department's office in New Delhi, the Educational Resources Center, to develop study materials on environmental problems in India for use in New York State schools and colleges. The team visited the Community Science Center in Ahmedabad, a major industrial city near Bombay, and studied environmental problems in Ahmedabad and Bombay. The team, in addition, visited the Government of India's Central Public Health Engineering Institute in Nagpur where new techniques for water and sewage treatments suitable for Indian conditions are being developed.

The Educational Resources Center was begun in 1965 to further the goal of the Board of Regents of increasing student knowledge of the cultures of other nations and of world issues. The Center seeks to assist the State Education Department in preparing students to live as informed adult citizens in a world increasingly complex and interdependent by enlarging understanding of Indian society and traditions, and by enlarging awareness of the Indian experience as it relates to global problems.

The ERC is administered by the New York State Education Department's Center for International Programs and Comparative Studies in Albany and funded by the United States Office of Education under P.L 480. Several of ERC's publications are noted in this supplement and more information about these and other publications and projects may be obtained from Norman Abramowitz, associate, Center for International Programs and Comparative Studies, who coordinated the team visit and reviewed this manuscript.

The manuscript was prepared for publication, with assistance from Janet M. Gilbert, associate, Bureau of General Education Curriculum Development, by Barry W. Jamason, associate, Bureau of General Education Curriculum Development.

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SOCIAL STUDIES (9)

Environment and Development in a Developing Nation: India

SYLLABUS REFERENCE

Social Studies, Grade 9: Asian and African Culture Studies; *Topic 4, South Asia (India and Pakistan)*

ENVIRONMENTAL REFERENCES

Economic/Social/Cultural Environments; Energy; Health; Pollution; Population; Resources; Solid Waste; Transportation

INTRODUCTION

The purpose of the unit is to provide a supplement to Asian Studies programs with the particular emphasis upon the environmental concerns of India as a representative developing nation.

The five topics in the unit lend themselves to the use of several different strategies. One such strategy is suggested by the manner in which all five topics are organized. Each topic begins with a rationale and objectives. The background information provides an introduction to the topic and leads to the consideration of a major problem, paradox, or quandary. (This major problem or question will not lend itself to a simple or single answer, but requires lengthy discussion in order that impressions may be formed. Questions such as these are frequently the springboards for public policy decisions.) The next step is to consider the slide prints reproduced in the manual with their captions. Concluding statements or generalizations may be made by members of the class and the instructor and should serve as observations on, or summations of, the foregoing material.

In addition to this approach, instructors should consider using one or more of the alternative instructional strategies provided below.

INSTRUCTIONAL STRATEGIES

1. *Comparison and Contrast* - Develop information about the United States which parallels that provided in the slides and background information on India. Point out similarities of both nations in terms of pollution, population, priorities, values, etc. Make a list of the dramatic differences between the two countries. As a counterpoint to this exercise, an underdeveloped nation should be substituted for the United States and the procedure suggested above should be repeated.

   Assess the probabilities of reconciling the differences or gaps which have been demonstrated to exist between the countries compared.

2. *An Inductive Approach* - Using any or all of the five topics of this manual, have the students apply the following procedures to the materials:

   a. Observe the photographs.
   b. Identify and categorize the problems explicit (or implicit) in the photos.

c. From the students, elicit tentative solutions for the difficulty, the conflict, or the evident insufficiency based upon their own knowledge of similar problems in this country.

d. Test these tentative solutions against the realities which might inhibit simple solutions. (Use the background information and the generalizations provided in this manual as well as other available resource information.)

e. The students should be encouraged to draw conclusions based upon the observations made, the evidence gathered, and the tentative solutions developed. (These conclusions may then be compared with those provided in each part of the manual.)

3. *The Single Concept Lesson* - It is worthwhile to consider dealing individually with some selected photographs and the concepts they represent. Many of these pictures will lend themselves to separate treatment if used as the central ideas in individual lessons.

Select a photograph which has evinced particular interest among the students.

EXAMPLE: See TOPIC 3, page 19.

[9]*Underemployment - workers awaiting hire*

Have the students gather information about labor and unemployment in India. Discuss the following related ideas:

- Population and the labor force
- Unskilled labor in developing nations
- Welfare programs in developed nations and their relationship to unemployment, advancing technology, and economic growth
- Unemployment in developed nations

TOPIC 1 ONLY ONE EARTH

RATIONALE

Heightened public concern over the past few years has enabled the United States to make significant progress in the area of environmental protection. Yet (as forcefully demonstrated by the energy crisis) this country does not, and cannot, exist as a nation unto itself. Indeed, it is in the broader context of a world divided into "have" and "have not" nations that the global environmental dilemma assumes its most staggering and perplexing proportions. The United Nations Conference on the Human Environment in 1972 and the Action Program subsequently adopted by the General Assembly represented a unique opportunity to transform national differences into common causes. Since the ultimate quality of life on this planet may be related to the success of this conference and the activities it generated, what happened at Stockholm in June, 1972, and what has happened since then, is the concern of all.

OBJECTIVES

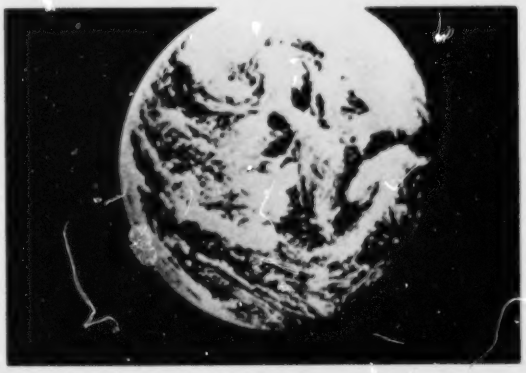
- To make students aware that environmental problems and their solutions are perceived differently by industrialized nations and by developing nations
- To explore the basic conflicts which surfaced at Stockholm and which threaten any cooperative efforts to improve the condition of the human environment
- To chronicle and review both the events and the results of the 1972 United Nations conference in Stockholm

BACKGROUND

"The dominant image of the age in which we live is that of the earth rising above the horizon of the moon - a beautiful, solitary, fragile sphere which provides the home and sustains the life of the entire human species.[1]

"From this perspective it is impossible to see the boundaries of nations and all other artifical barriers that divide men. What brings it home to us with dramatic force is the reality that our common dependence on the health of our, only one earth, and our common interest in caring for it transcend all our manmade divisions. Let this be the basis, the environmental view, that guides our decisions in the days ahead as we chart our course for the future."

(Maurice Strong)



[1] *Spaceship Earth*

Alarmed by the rise in global pollution and the growing gap between the "have" and "have not" nations, the General Assembly of the United Nations[2] voted in 1968 to plan the first Conference on the Human Environment.

Sweden was designated as the host nation and Maurice Strong was appointed Secretary-General. After months of planning and the drafting of innumerable preliminary resolutions, the delegates of 114 countries assembled at Stockholm[3] on June 5, 1972. Notable by their absence were eastern European representatives, who boycotted the conference as the result of a dispute over the seating of East Germany.

In addition to the official representatives, the population of Stockholm was swelled by an influx of citizens representing approximately one thousand organizations whose presence reflected their basic concerns. Some 500 of these groups were granted semi-official observer status as Non-Governmental Organizations (NGO's[4]). The remainder participated in two "happenings" outside the conference itself: The Environment Forum[5], which focused attention on the ecological effects of war and on the issues of population control and technology; and, a tent commune, set up in an abandoned airport south of the city.

The work of the conference centered on three areas: (1) the drafting of a 25-point Declaration on the Human Environment; (2) an Action Plan to implement the guiding principles set forth in the Declaration; and, (3) the creation of international machinery to fund and operate the entire program. As drafted, the Action Plan consists of 109 recommendations which fit into a framework of three elements: Environmental Assessment (Earthwatch); Environmental Management; and, Supporting Measures in the area of public information and education.

[2]*United Nations - New York City*

[3]*Stockholm, Sweden*

[4]*Anthropologist Margaret Mead addressing NGO's*

Most of the drama of the conference was generated by a closed door debate whose purpose was to produce a Declaration which would be acceptable to all of the participants. At times, politics clearly took precedence over environment, but after eight straight days and nights of meetings, a draft declaration was ratified by the delegates by acclamation during the closing hours of the conference. (A copy of the Preamble and a summary of the 25 points are appended.) Two additional measures were adopted: a call to ban all weapons testing (opposed by France and China); and, the designation of June 5 as worldwide "Earth Day." While not binding on any of the participants, it was the hope of conferees that the Declaration on the Human Environment would provide a foundation for the development of international law in this crucial area.

[5]*The Environment Forum*

A major component of the Action Plan is Earthwatch, a proposal to set up and maintain a global environmental monitoring system[6] and to provide for pollution-related research and the ongoing evaluation and exchange of environmental data. The goal of these activities is to provide for the identification and control of pollutants which cross international boundaries.

[6]*Monitoring air pollution in India*

The remainder of the Action Plan recommendations fall in the areas of Human Settlements, the environmental aspects of Natural Resources Management, and the "conflict between industrial development and the preservation of environmental quality." The latter was a special concern of the underdeveloped countries, or UDC's, who came to the conference with the fear that the industrialized states would use their concern over mounting pollution as an excuse to prevent the economic growth and development of underdeveloped areas. Mrs. Indira Gandhi,[7] then Prime Minister of India (and the only head of state other than host nation Sweden's Olaf Palme to visit

[7]*Madame Gandhi addressing Conference*

the conference), was an eloquent spokesperson for the developing nations' position:

"On the one hand the rich look askance at our continuing poverty; on the other, they warn us against our own methods. We do not wish to impoverish the environment any further and yet we cannot for a moment forget the grim poverty of large numbers of people. Are not poverty and need the greatest polluters? When people themselves feel deprived, how can we urge the preservation of animals? How can we speak to those who live in villages and slums about keeping the oceans, the rivers, and the air clean when their own lives are contaminated at the source? The environment cannot be improved in conditions of poverty. Nor can poverty be eradicated without the use of science and technology."

Thus were delineated the two contrasting viewpoints[8,9] in the matter of defining environmental problems.

To implement the Action Plan, the United Nations established a 58-nation, intergovernmental policymaking body, now known as the United Nations Environment Program. Of special significance is the fact that UNEP is independent of existing United Nations agencies. A secretariat, headed by Secretary General Maurice Strong, was formed to carry out the program's policies. Due to political pressures, it was decided to locate the secretariat and staff (300, including 100 professionals in a variety of fields) in Nairobi, Kenya, rather than in Geneva. A special environmental fund of $100 million from United Nations members was allocated over a five-year period to fund the Environmental Program. The United States has pledged forty million dollars for this purpose.

In addition to clearing the administrative hurdles described above, the Environmental Program has achieved

[8]*A slum in Ahmedabad, India*

[9]*Pollution - New York City*

[10]*Bengal Tiger*

a number of operational successes since the Stockholm Conference. At its initial meeting (in Geneva, June, 1973) the Governing Council stressed that the quality of human life constituted the central concern of the Environmental Program and made preparations to implement various portions of the Action Plan. Ground rules governing the use of the environmental fund were also adopted. Other accomplishments include:

- A 79-nation agreement to halt the ocean dumping. (1972)
- A treaty signed by 80 countries to end commercial traffic in endangered species[10] (1972, ratified, July 1974).
- Establishment of a World Heritage Trust to preserve cultural and environmental materials.
- Participation by eastern European nations in the Governing Council.
- Investigated over 300 projects ranging from tree-planting to inhibit desert growth to studies of the implications of atomic power for developing or underdeveloped nations.
- Conducted a successful second annual session in its new headquarters in Nairobi, Kenya (1974).
- Organized a conference of 18 nations to develop a program for rehabilitating the badly polluted Mediterranean (1975).
- Convened a worldwide conference of Human Settlements in Vancouver, British Columbia, Canada.

On the other hand, there have been some disappointments:

- The failure to persuade the International Whaling Commission to impose a moratorium on whale harvests.
- Unsuccessful efforts to preserve fast-dwindling fertile soil.
- Little progress in the activation of regional programs for environmental protection.
- The failure, so far, of the Law of the Sea Conference to incorporate environmental considerations as a basic premise of its deliberations.

Maurice Strong resigned his post as Secretary-General of UNEP, and was succeeded by his deputy, Mustafa Kamal Tolba, an Egyptian microbiologist, at the 1976 annual session.

PROBLEM FOR DISCUSSION

Industrialized countries, whether capitalist or socialist, owe their higher living standards to economies which together consume over 80% of the world's most important resources. At the Stockholm Conference the developing nations insisted that vastly increased development offered the only possible solution to their problems. But industrial growth requires raw materials. Is it likely that the industrialized states will curtail growth, or even tolerate no-growth, in their own consumption (and life styles) to give the "have nots," who contain most of the world's population, their fair share?

QUESTIONS AND ACTIVITIES

- What has been the relationship between industrial development and pollution? Is there an opportunity for the developing nations to benefit from the historical experience of industrialized nations in terms of pollution control?

- Will the acceleration of industrialization in developing nations lead to a rapid (and potentially deadly) rise in global pollution levels? Explain.

- During an average five-year period the nations of the world collectively spend about $1,000,000,000,000 (one trillion dollars) on arms and armies. The United Nations is seeking a fund of $100,000,000 (one hundred million dollars) to run the Environmental Program over the same time span. What does this tell you about political behavior versus human (or humane) commitments to solve crucial environmental and social problems?

- How do environmental problems in developing nations like India differ from those in our own?

- Refer to Madame Gandhi's eloquent statement on environmental concern found on page 6. Discuss her statement, underscoring the points with which you agree and the points with which you disagree.

  Regardless of whether you agree or disagree with her statement, prepare a brief speech rebutting the stand she takes.

- Consider the results of a recent Harris poll conducted in the United States:

ISSUES OF CONCERN

	1974	1973	1972
	%	%	%
Economy	82	72	57
Integrity in government	22	43	5
Energy shortage	16	10	—
Crime	15	17	16
Pollution, ecology	9	11	13
Taxes	9	11	40
Welfare reform	8	13	15
Foreign policy	5	4	29
Housing	5	2	3
Drugs	4	14	19
Education	4	9	7
Older people	4	7	10
Alienation	3	8	1
Health care	2	3	5
Racial discrimination	2	7	21

Note: Percentages add to more than 100% because some people cited more than one problem.

- How would you have ranked these issues? How does this compare with the way your classmates would rank them?

- Suggest what the results would look like if the poll were conducted in India and give reasons for the relative priorities you assume would be those of the Indian people.

RESOURCES

Myrdal, K. G. "Transfer of Technology to Underdeveloped Countries," Scientific American, September, 1974, pp. 172-178.

United Nations Environment Programme. Report of the Governing Council on the work of its second session. New York: United Nations, 1974.

United States Department of State. Stockholm and Beyond. Department of State Publication 8657. Washington, D.C.: U.S. Government Printing Office, 1972.

TOPIC 2 INTRODUCTION TO INDIA: THE LAND AND THE PEOPLE

RATIONALE

Having examined India in terms of its relationship to the United Nations and that organization's concern for the human environment in Topic 1, it is now appropriate to attempt a broad view of what India[1] suggests to outsiders; of where and how the people live and occupy themselves.

[1] *India - Political*

OBJECTIVES

- To illustrate both the diversity of the people and the way they live, while suggesting the adversity they face.
- To create an overall impression of life in India which will serve as a basis for understanding people and lifestyles in developing nations.

BACKGROUND INFORMATION

To begin with, the illustrations in this topic suggest some uncritical simplified impressions and images[2,3,4] of India commonly held prior to any study of the nation and its people.

The South Asia subcontinent, the major portion of which is the nation of India, is separated from the rest of Asia by high mountain ranges. The area contains great diversities in topography, climate, people, languages, and religions.

India is the seventh largest country in the world, approximately half the size of the United States. Physically, the country is composed of three major structural divisions: the Indo-Gangetic Plain, which is the northern lowland formed by the

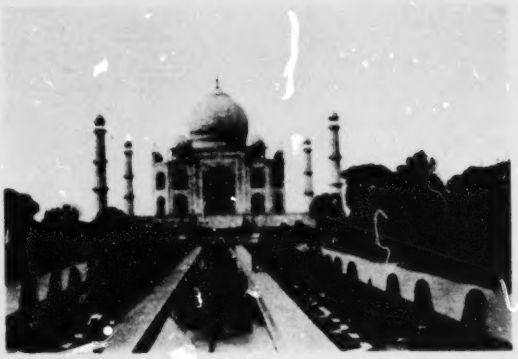
[2] *Mahatma Gandhi*

adjacent plains of the Indus, Ganges, and Brahmaputra rivers; the southern peninsula which is made up of many mountain ranges and hills, several extensive plateaus interspersed by basins, eastern and western coastal plains; and, the northern mountain wall consisting chiefly of the Himalayan mountain system and forming a natural frontier between India and her northern neighbors.

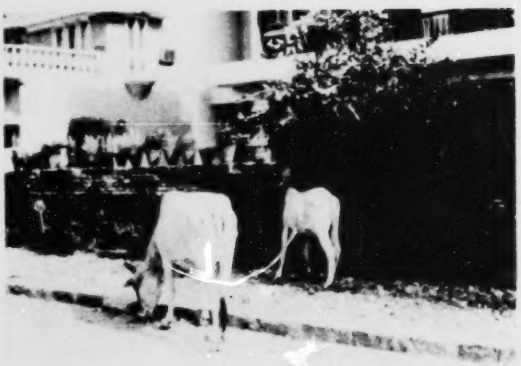
Most of India's climate is characterized by three distinct seasons, the "hot," the "wet," and the "cold." The "hot" season is one of occasional thundershowers. This season corresponds to our springtime, that is, from March to June. The "wet" season lasts from the middle of June to September, with the monsoons (seasonal winds) picking up moisture from the Indian Ocean and depositing no less than 20-30 inches and as much as 450 inches of rainfall annually over most of the country. The "cold" season lasts from October until February when the weather becomes mild except in the mountains.

Possessing a tremendous diversity of climate and physical conditions, India has a great variety of fauna. Tibetan sheep, antelope, and gazelles; snow leopards; red and black bears; tigers; countless other mammals and reptiles; many species of deer; and, birds with dramatic plumage constitute merely a partial listing of India's wildlife. However, population growth and dwindling forest reserves have affected the fauna and national parks and sanctuaries have been established.

India is the second most populous nation in the world with more than 600,000,000 people who represent most of the major racial groups of man, although 90 percent are Caucasian. As could be expected, among this multitude of people, there are a variety of languages and customs[5,6,7].



[3]*The Taj Mahal*



[4]*The ubiquitous "sacred cows"*

[5]*A Moslem woman*

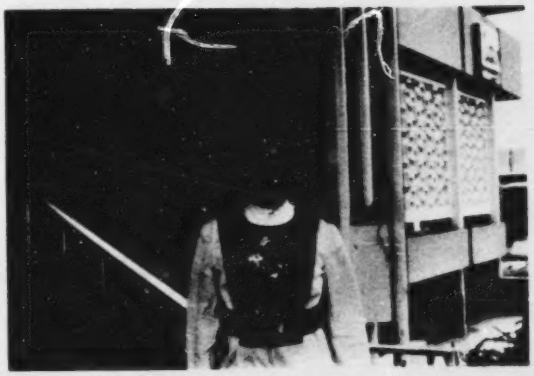
To be more specific, there are over 180 languages, excluding dialects, spoken in India, including 14 major ones of which Hindi, the official language of India and spoken by half the people, is predominant. Obviously, this diversity is a significant obstacle to national development. Although English serves as a common language among educated Indians, it is spoken by only 2 percent of the people.

The predominant way of life in India is non-urban and non-industrial as evidenced by a population which is 80 percent rural. The people in these rural areas of India are attractive, engaging[8-11] and resourceful, despite considerable deprivation and disadvantage.[12-15]

However, the rural-urban population configuration is slowly changing as increasing industrialization attracts villagers to urban areas with hopes of betterment. In this process, however, the contrast between village and city is not lessened,[16,17] since, for those who have migrated to the cities, the village from whence they or their families came is still the determinant of many aspects of life and interpersonal relationships. It may be then, that an examination of village life would lend considerable insight to the character of India and its people. (The resource, Teaching About India, which is listed on p. 15, provides suggestions for a case study of the village in India.)

The ways in which the people in cities and those in villages live and occupy themselves vary widely. In fact, these differences have presented enormous difficulty in terms of the assimilation of people who migrate from the rural areas to the cities: the ranks of unemployment swell; housing becomes a severe problem; and, the health of the transplanted peasants

[6] *Wedding attire, probably tribal*



[7] *A Sikh*

[8] *A peasant in his Nehru cap*

is seriously compromised by the rampant disease germs against which they have not developed immunity. (See Topic 5.)

PROBLEM FOR DISCUSSION

Land reform laws are being passed to provide for a more equitable distribution of farmland among the huge rural population at the same time that thousands upon thousands of these people are moving to the cities and swelling the ranks of the under- and unemployed. Although this theoretically eases the land distribution problem, it creates the even greater problem of providing jobs welfare, and housing in increasingly dense urban areas.

QUESTIONS AND ACTIVITIES

- If land is redistributed to give a greater number of farmers a share in agricultural productivity, how does this affect India's need for intensive, mechanized, highly-productive farm activity?
- To what extent are agricultural cooperatives a solution to this dilemma?
- How effectively can public welfare compete for rupees in an economy which requires heavy investments in industry and agriculture merely to "keep even" with the logistical requirements of a population of more than 600,000,000?
- How should the Indian government handle the dilemma of dealing with the encroachment of population growth, and its accompanying agricultural requirements, upon the environment (in this case, wildlife, forests, soils, and water supply)?

[9] *Several generations of villagers*

[10] *The hope of any nation*

[11] *Village boys*

- Using available resources, describe, with a well-outlined essay, an Indian village in terms of its:
  - relation to the nation, to urban areas, and to the outside world
  - residence patterns and land use
  - soil, climate, topography, vegetation, and water supply
  - ethnic and social composition
  - daily life and routines
  - population change or fluctuation (birth and death rates, migration)
  - government
  - festivals and special occasions.

RESOURCES

Bryce, L. Winifred. India: Land of Rivers. Nashville, TN: Thomas Nelson, Inc., 1966 (for students, grades 7-9)

Davies, C. Collin. An Historical Atlas of the Indian Peninsula. New Delhi, India: Oxford University Press, 1969.

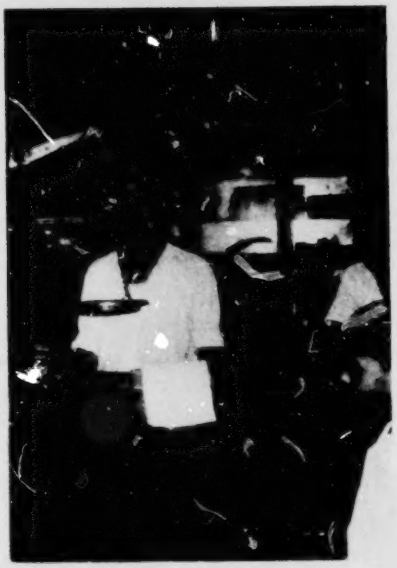
"A Drive is on to Save the Asian Lions with a Second Sanctuary in India," New York Times, January 20, 1974.

Franda, M. F. "India in Crisis," Current, May 1975, pp. 36-49.

Gananathan, V. S. Economic Geography of India. New Delhi, India: National Book Trust, 1967.

Heimsath, Charles H. Teacher's Introduction to India. Albany, NY and New Delhi, India: Educational Resources Center, New York State Education Department, 1973.

India: A Reference Manual, 1973. New Delhi, India: Publications Division, Ministry of Information and Broadcasting, 1973.



[12] *Village commerce*

[13] *A fisherman tending his nets*

[14] *Farming*

Mehta, V. "Letter from New Delhi," New Yorker, October 14, 1974, pp. 147-161

Teaching About India. Albany, NY: New York State Education Department, 1972.

Tudisco, A. Jeff. Caste and Class in Village India. Field Educational Publications, 1969.

[15]*Shepherd and flock*

[16]*Village thoroughfare*

[17]*City thoroughfare*

TOPIC 3 POPULATION: PROBLEMS, PORTENTS, AND POTIONS

RATIONALE

Rapid population growth in India is a threat to economic development and as such raises the question of whether production can keep pace with the increasing need for goods (especially food) and services. Thus, population is central to any discussion of India and its future, both in an environmental context, and in a general discussion of the nation's role as a major Asian economic, political, and social entity.

OBJECTIVES

- To develop an awareness of the complex problem of population as it relates to resources and economic potential in developing nations where the balance between population and delivered goods and resources is difficult to achieve.
- To understand the significance of family planning considerations in a developing Asian nation.

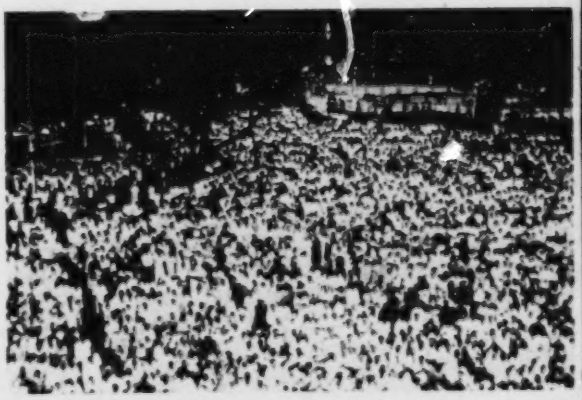
BACKGROUND INFORMATION

India's population in 1971 was 584 million. Based upon an estimated annual growth rate of 2.1 percent for the decade 1961-1970, one might suppose that the population has continued to grow at a similar rate to about 660 million in 1977.[1,2] At this rate, the 584 million figure would probably double by the year 2003. These figures, along with the fact that India is half the size of the United States, means that the population density of India (458 persons per square mile) is eight times that of the United States (57 persons per square mile).

A large part of the nation's population is found in one-half million villages of 500-1500 persons each.[3] Yet there are 100 cities with populations in excess of 100,000, including seven (Bombay, Calcutta, New Delhi,[4] Madras, Ahmedabad, Hyderabad, and Jaipur) which exceed 1,000,000.

The factors which have created the population problem are numerous.

[1] *Some of India's children*



[2] *An urban gathering*

Generally, in underdeveloped nations, the technologies of health and hygiene are transmitted more rapidly than the technology of production and growth. Thus, the death rate has dropped sharply while the birth rate has remained constant. As a consequence, this large net gain in population erodes economic growth when it is measured on a per capital basis.

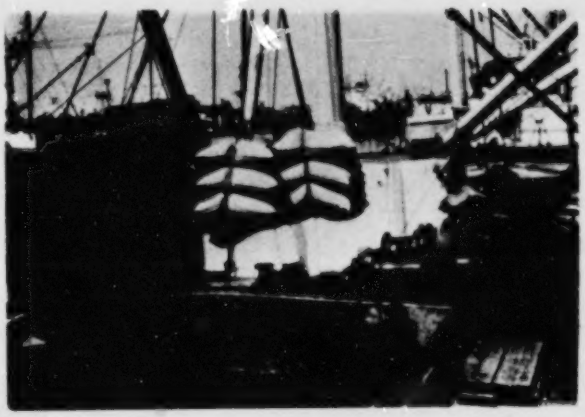
These facts must be incorporated into our assessment of India's economic growth potential to determine on what level the nation can continue to exist. The needs of a population which is increasing at this rate are almost incalculable. It will be necessary to double food production by the end of the 1980's merely to maintain (not improve) India's substandard nutritional level.[5] Of course, the disproportionate attention that must be given the problem of food supply limits the investment that can be made in other areas of progress and growth. The second basic need, that of shelter, is largely unattended to: significant migration to the cities creates slums[6] and unanswerable demands upon social services;[7,8] and, little is done to improve the living conditions of the peasants in rural areas.

Money invested in the agrarian side of the economy is not available for use as a stimulus for industrialization, thus the number of jobs does not keep pace with the growing labor force. As agriculture becomes more intensive and more mechanized, workers no longer needed in farming move to the cities and swell the ranks of the unemployed.[9]

In light of the above, it is clear that population growth must be limited, but in a manner which is not anachronistic to custom, culture, and religious tradition. For example, the task of feeding India's millions must be accomplished with due consideration of what the people can and will eat.

[3]*A fishing village near Bombay*

[4]*A view of New Delhi*



[5]*Offloading imported wheat*

The official government approach, that the problem is a very private question which must be resolved on an individual basis, intelligently, through education,[10-14] is a step in the right direction, although it encourages passivity when much more is needed. In addition to the fact that a young population (almost half of India's population is under 16 years of age) requires a substantially higher percentage of public funds for social services (clinics, schools, etc.) than is necessary in Western countries where the median age is 30 to 35, it is a population which will soon contain a huge group of women of child-bearing age.

PROBLEM FOR DISCUSSION

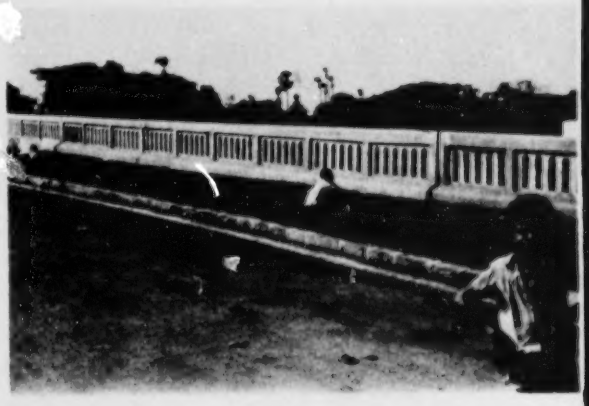
The experience of the developed nations has been that a rising standard of living is accompanied by a decline in family size. If this is to become true for India, how can the nation feed its huge, growing population, provide social services, and stimulate economic growth, all at the same time?

QUESTIONS

- If education is a means of changing attitudes about population growth and family size, how does a nation commit funds for educational facilities and services when there is such a demand for capital from the industrial sector?
- How can India cope with the catastrophic consequences of periodic droughts, famines, and energy crisis, and at the same time maintain economic growth?
- Is India utilizing its human resources as effectively as a nation like China? Explain.
- Understand that the relationship between births and deaths

[6]*A slum in Ahmedabad*

[7]*Sanitation and street litter*



[8]*Sanitation - lack of toilet facilities*

in the population may be used to demonstrate the potential for future population growth as follows:

$$\text{birth rate} = \frac{\text{No. of births per year}}{\text{population}} \times 1000$$

$$\text{death rate} = \frac{\text{No. of deaths per year}}{\text{population}} \times 1000$$

and,

birth rate - death rate = the rate of population growth*

For example, consider the following data for the United States in 1972:

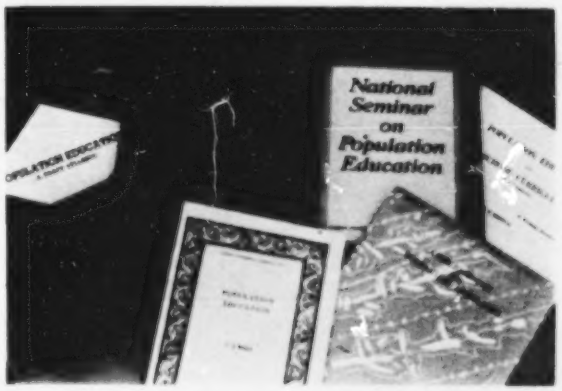
$$15.6 \text{ (birth rate)} - 9.4 \text{ (death rate)} = \frac{6.2}{10} = .62\%$$

Thus, .62% was the population growth rate for the United States in 1972.

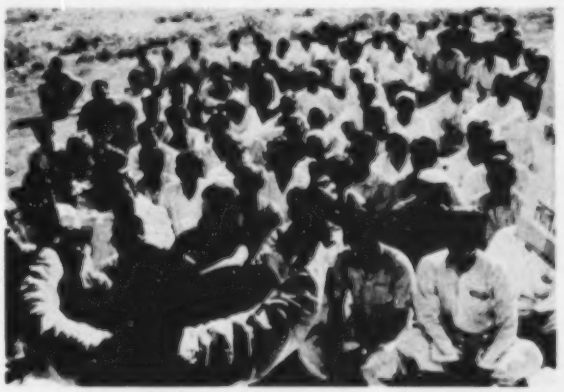
- Use standard reference tools to determine the birth and death rate data for India during a recent year.
- What is India's annual rate of population growth?
- What other nations have similar growth rates?
- How do these rates compare with rates for Western European and North American nations?
- Which nation has the lowest population growth rate? Which has the highest?

*Since birth rates and death rates are expressed as numbers per thousand and growth rate is expressed as percent (per hundred), the difference between birth and death rates must be divided by 10 to arrive at the population growth rate percentage.

[9]*Underemployment - workers for hire*



[10]*Population education materials*



[11]*A population education clinic for men*

- Speculate as to what the state of economic, political, and social development has to do with population growth.

- It is frequently useful to be able to estimate when a nation's population will double. Explain why after using the information below to determine when India's population (and that of several other representative nations) will double.

  There is a simple mathematical relationship between the rate of population increase and population doubling time:

  $$\frac{70}{\text{growth rate}} = \text{doubling time}$$

  $\frac{70}{.62}$ = 113 yrs. (approx.) before the population of the United States will double, assuming the growth rate remains unchanged.

  - When will India's population double?
  - Describe the measures you, if you were a member of the Indian government, would recommend to prepare for the doubling of the population. What if anything, would you recommend be done to delay this occurrence?

- The most crucial of India's problems is the ratio of increase in food production to population increase.

  - Describe the factors which contribute to the nation's population increase.
  - Learn what efforts are being made to control population growth.
  - Discuss the problems inherent in India's attempts to

[12] *Population education for women*

[13] *Promoting the "ideal" family size*

[14] *The "ideal" family*

increase agricultural productivity. *(See also Topic 5.)*

RESOURCES

Anderson, Randall C. "Introducing the World Population Crisis to Secondary Social Studies Classes: An Enquiry-Oriented Instructional Strategy," Social Education, 1970.

The Challenge of Six Billion, 27½ min. film, color. Summit, NJ: Modern Talking Picture Service.

"Equilibrium," Zero Population Growth, January, 1974.

Kapur, Promilla. "Need for Family Life Education." Social Action, January-March, 1971.

Marsick, Victoria J. Literacy and Family Planning in India. Syracuse, NY: School of Public Administration, Syracuse University, 1968.

Mehta, T. S., et al. Population Education, a Draft Syllabus. New Delhi, India: National Council of Educational Research and Training, 1971.

Poti, S. J. "Study of the Indian Population Growth," Indian Population Bulletin, April, 1960.

TOPIC 4 INDUSTRIALIZATION IN A DEVELOPING COUNTRY

RATIONALE

One of the most complex concerns of developing nations is that of economic development. The developed nations use a tremendously disproportionate amount of the world's resources to maintain a standard of living which stands as a "model" of attainment for developing nations (once the spectre of starvation has been removed and a subsistence economy realized). The competition for, and strain upon, world resources, and the environmental impact of such a quest by two-thirds of the world's people may well be one of this century's most dramatic events.

OBJECTIVES

- To characterize and illustrate the progress, constraints, problems, and manifestations of industrial development in a nation such as India
- To assess the environmental impact of development on a scale sufficient unto the needs of India's masses

BACKGROUND INFORMATION

Economic development in India has been characterized by a series of five-year plans which began in 1951. As a result of four of these efforts, India's national income rose from $21 billion to $40 billion. Industrial production increased 150 percent and personal income rose 30 percent in those 20 years, despite a huge population increase.

India continues to make strides in industrial development[1] and has strengthened itself in the fields of nuclear energy and military power. However, the gross national product (adjusted for inflation) has shown little if any gain since 1971, while the population has continued to increase rapidly. Together, these factors suggest that the standard of living for the majority has actually declined. Yet, with the desperate need for rapid industrialization India, severely restricts foreign investment and rigidly controls those investments which are permitted.

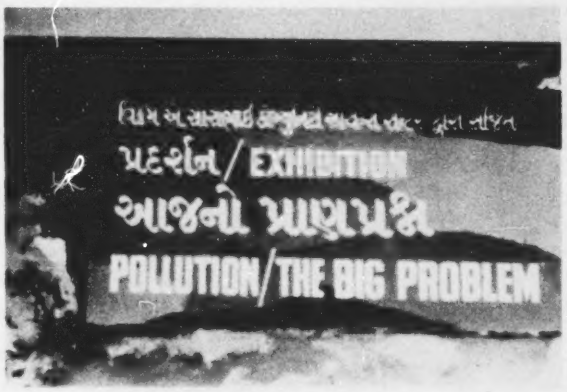
A problem common to developing nations, including India, is the growth of industrialized pockets with a resultant concentration of population in the cities.[2] Consequently, degradation of the environment often proceeds in these areas with unparalleled intensity. Yet, pollution control often appears prohibitively expensive to countries where accelerated economic growth has an absolute priority.

[1] *Tractors leaving assembly line*

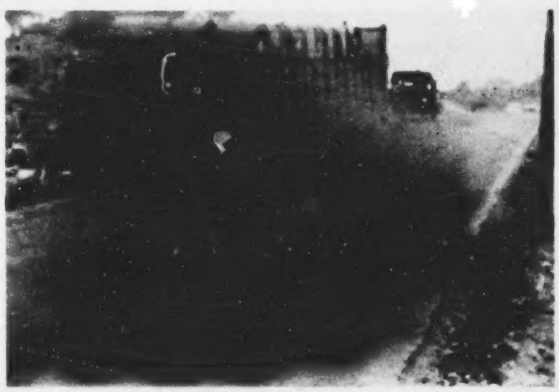
The common forms of pollution[3] in a developing nation differ only in degree from those of highly industrialized nations. Air,[4] water, and, to a lesser extent, noise and visual pollution are increasingly difficult problems which must be confronted. For example, the concentration of population growth and industrialization necessitates a more critical look at water as a resource. Agriculture presently accounts for 70 percent of all water used and present demand will increase significantly as industrial development proceeds. Moreover, if nuclear energy use becomes more prevalent, severe strains will be placed upon water supplies already subjected to the vicissitudes of periodic, prolonged droughts. The resulting heat load on the aquatic environment, coupled with the high nutrient content of water used in irrigation, and the environmental impact of regional tranfer of water (witness our own problem in northern and southern California) may require more stringent controls than a developing nation with other economic priorities is prepared to undertake. Water treatment[5] is imperative not only because of high utilization of a limited resource, but for health reasons as well. High population densities, paired with the prevalence of water-borne diseases such as cholera and typhoid, make epidemics an ever-present threat.[6]

No discussion of industrialization in developing countries would be complete without considering the concept of recycling.[7] Among people who are economically disadvantaged, almost any material object becomes an actual or potential resource. The poor are inclined, both culturally and by necessity, to conserve or reuse a variety of objects. Various forms of waste[8,9] (paper, glass, metals), while they are generally considered to be garbage in the United States (although this attitude is undergoing change), have an extremely long life

[2]*Living in an industrialized area*



[3]*A sign of the times*

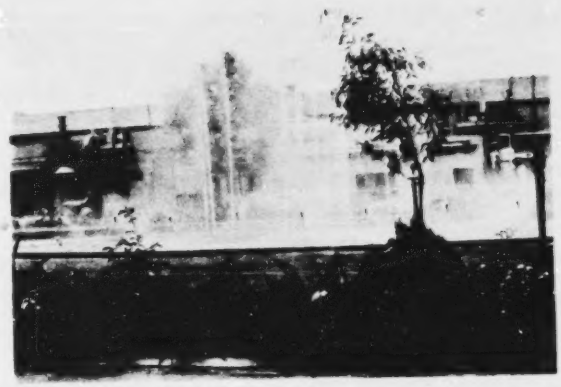


[4]*Air pollution*

through reuse in India. In fact, both in terms of environmental protection and economic development, this understanding of, and commitment to, recycling has tremendous potential if properly exploited.

Other characteristics of India's economic and industrial development should be noted. It has a rapidly growing chemical industry.[10] It has been producing fine textiles for a century. It makes its own telephone equipment. And, surprisingly, it makes all sizes of machine tools[11] — of sufficient quality and quantity for export to "advanced" countries. But there are problems. One is a multiplicity of economic controls that causes delays, encourages monopolies and "black market" dealings, reduces efficiency and initiative, and invites the corruption of the regulators by the regulated. Another is the scarcity of managerial skills. Still another is the politicizing of labor movements to a degree that contributes more to disorder, violence, and destruction than it does to the welfare of workers and the productivity of industry. A fourth bottleneck is the reduced supply of certain raw materials and many small parts, especially those which have to run the gauntlet of importation restrictions and scarcity of foreign exchange credits. However, the greatest problem of all is the absence of a huge market for goods. Though the people are many, their incomes are too low to exercise sufficient demand for industrial expansion.

In addition to capital, raw materials, and an adequate labor force, transportation[12] is essential to development. And here is another facet of India's dilemma: the necessary upgrading of the distribution and communications system in a nation this size introduces a whole new set of environmental problems.



[5]*Water treatment - aeration plant*

[6]*A source of water in a Bombay slum*

[7]*Used bicycle parts for sale*

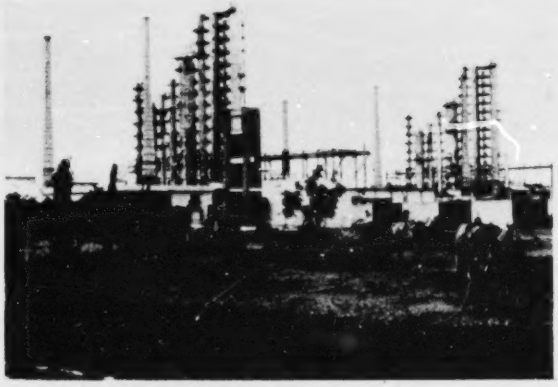
Transportation in India presently runs the gamut from human- or animal-drawn carrier devices to sophisticated jetliners and transports, although the latter are not used to anything like the extent that they are in Western nations. Human-[13] and animal-[14] powered vehicles provide a large proportion of India's surface transportation because the comparatively limited industrialization of the nation and its attendant economy (low per capita income) have limited the numbers of cars and trucks produced. Also, the profusion and proximity of villages and their way of life unfortunately make existing transport reasonably adequate as long as the aspirations of the villagers are not significantly raised.

The numbers of automobiles in use in the cities is increasing, but oxcarts and various forms of human-powered transport still abound. The country has an extensive highway network (1/2 million miles) but these roads are in disrepair and there are few service stations along them. India has a good basic railway network[15] and much greater advantage will have to be taken of this in the near future. The problem of food and water supply, for example, is often not a question of sufficiency, but rather one of distributing ample supplies of both, given the condition of transportation in the country.

The key to India's future — and indeed to that of two-thirds of the human species — is raising productivity in agriculture. All political dogmas, party slogans, planning strategies, and models of economic growth shrivel to insignificance in the face of this fact. There can be no industrialization without a surplus of food from farmers to feed industrial workers. There cannot be successful urbanization without a surplus of food in the countryside to feed the city. There is little prospect of absorbing

[8] *Recycling bottles*

[9] *Recycling wool*



[10] *A petrochemical plant*

the unemployed and underemployed except on the farms. In a nation 80 percent rural, there can be no mass market for industry unless rising agricultural productivity gives farmers higher incomes with which to buy the products of industry.

To summarize, the dilemna of development in developing nations is in part caused by the rising aspirations of the people to share the "good life" exemplified by industrial societies. To point out that environmental problems similar to those in Europe and North America must be avoided at all costs appears to be hypocritical, since this attitude was so uncharacteristic of early development in Western nations; and yet, these nations must profit from Western mistakes rather than follow these early bad examples.

PROBLEMS FOR DISCUSSION

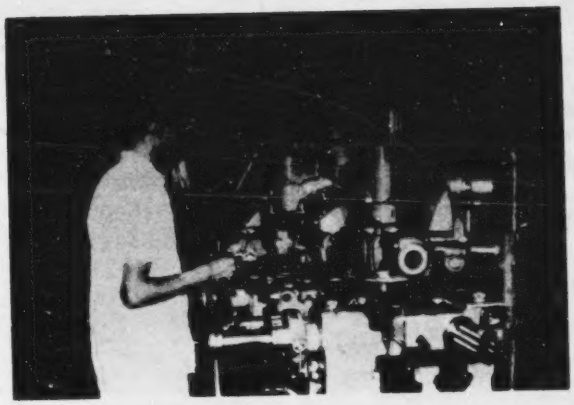
Consider the quandary posed by the following statement attributed to an official of a developing country:

> "The ultimate objective of both environmental control and economic development is the physical, mental, and social well-being of man. Thus, there is no conflict between development and environment so long as environmental policies do not hinder the development process."

Try to imagine both the reasons why other representatives of the developing nations would agree with the statement and the reasons why officials of industrial societies might disagree.

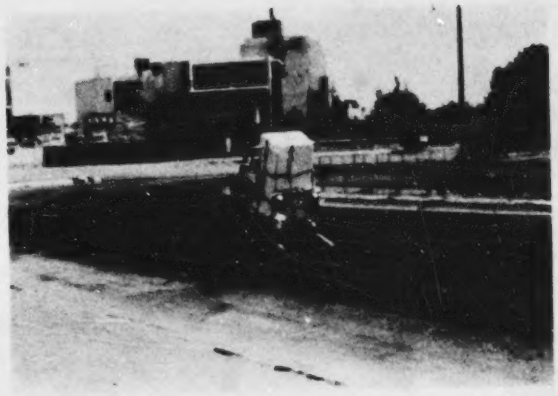
QUESTIONS

- How can liberal, democratic political objectives be reconciled with the authoritarian and oligarchical methods that



[11] *A machine tool factory*

[12] *Transportation - four modes*



[13] *Human-powered transport*

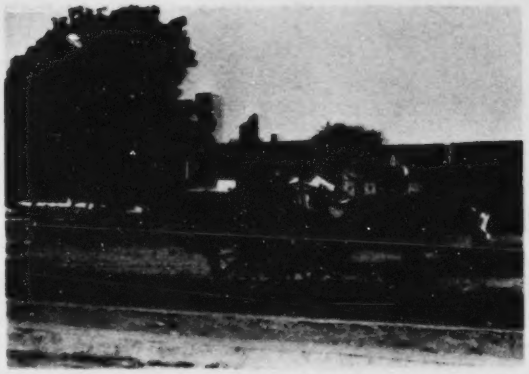
would, on the surface, seem to be a more "efficient" means of achieving economic objectives?

- How can the cultural and economic acceptance of the concept of recycling (by whatever name) by the Indian people be capitalized upon in environmental terms on an even wider scale?

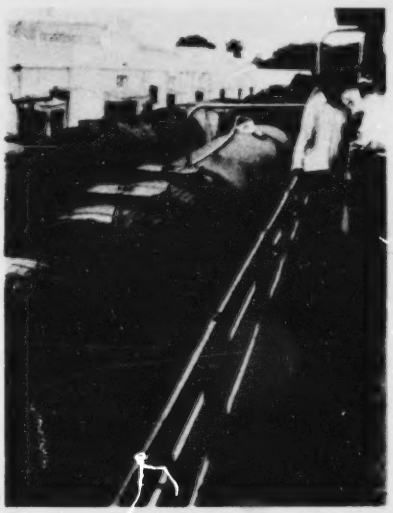
- Compare India's transportation system with that of an industrialized nation and evaluate this comparison in terms of continued development (at their respective paces) in both nations.

- Consider again the statement quoted above in Problem for Discussion. Compare this attitude with our present dilemma regarding the development of new energy sources and the question of environmental safeguards. Cite specific examples (nuclear power, strip mining, offshore drilling, etc.) and describe the issues as seen by both sides (government and/or industry versus environmentalists; government versus industry, etc.).

  Have students play the protagonists in one of these issues, doing the research necessary to debate the issue intelligently.



[14] *Animal-powered transport*



[15] *Rail transportation - tank cars*

- Suggest that committees of students select groups of comparative data for India and for the United States to be illustrated in the form of large, poster-sized graphs. Such data would include:

  - population and growth rate
  - GNP
  - per capita income
  - agricultural productivity

- Discuss Indian nationalism in terms of the country's stated social and economic goals. Specifically, what, if any, compromise in these goals must be made if the nation needs to defend its border and uphold and enhance its increasing stature among world nations?

RESOURCES

Bradley, C. C. "Human Water Needs and Water Use in America," Science, vol. 138, 1962, pp. 489-491.

Commoner, Barry. "The Environmental Cost of Economic Growth," in Sam H. Schurr, ed., Energy, Economic Growth, and Environment. Baltimore: Johns Hopkins Press for Resources for the Future, 1972.

Environmental Education Curriculum Infusion Units for grades 7-12. Albany, NY: New York State Education Department, 1975, pp. 154-155, 160-165.

Environmental Protection Agency. Health Effects of Environmental Pollution. Washington: Government Printing Office.

An Environmental Syllabus, grades 10, 11, 12. Unit 8: Pollution, pp. 110-128. Albany, NY: New York State Education Department, 1977.

Rahman, A., et al. Science and Technology in India. New Delhi, India: Indian Council for Cultural Relations, 1973.

Where Do We Go From Here? Albany, NY and New Delhi, India: Educational Resources Center, New York State Education Department, 1974.

TOPIC 5 MEETING HUMAN NEEDS IN A DEVELOPING COUNTRY

RATIONALE

Food, water, shelter, sanitation, education, and employment, really, much of what is taken for granted in industrialized societies, are often in short supply or lacking altogether in developing countries. "Are not poverty and need the greatest polluters?" asked then Prime Minister Indira Gandhi at the Stockholm Conference on the Human Environment. Some progress has been made, but despite intensive efforts to raise living standards, the gap between rich and poor nations continues to widen. In India, where the population is expected to double by the turn of the century, success in coping with these problems is of critical importance. Both political stability and the survival of large numbers of people are at stake.

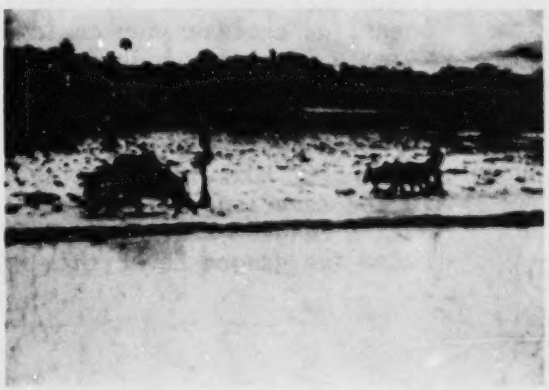
OBJECTIVES

- To document the conditions of the human environment in a developing country which has limited resources and a rapidly growing population
- To illustrate some of the approaches taken and the problems encountered in attempting to meet human needs in developing nations
- To understand how an interplay of biological, economic, and cultural factors affects both the quality of life in India and the prospects for improving it

BACKGROUND INFORMATION

Contrary to popular belief, the life of a typical Indian is not synonomous with the teeming streets of Calcutta or Bombay. India is primarily a nation of small villages, inasmuch as over one-half million of these villages provide shelter and employment for 80 percent of the population. While the majority of the people earn their living from the land, a significant movement of people in and out of large urban centers is characteristic. These people are seasonal laborers and other workers who leave their families to seek work in the cities for varying lengths of time.

Increasing the level of agricultural productivity is vital in a heavily populated nation such as India where virtually all of the potentially arable land is already under cultivation.[1] Indeed, given the twin pressures of a rapidly growing population and the diversion of more and more land to urban and industrial expansion, the usable acreage per capita actually declined by about 25 percent from 1920-1960. An apparent



[1] *Rice paddies*

answer to this dilemma was the introduction of the special high-yield strands of wheat and rice that initiated the so-called "Green Revolution."[2] As a result, total grain production rose from 76.4 million tons in 1960-1961 to a record 107.8 million tons in 1970-71. For the first time since independence, hope for self-sufficiency seemed to be more than an elusive promise. Then disaster struck. For two years drought and floods[3] wiped out anticipated gains and India was once again importing wheat to reduce the threat of famine. (Floods are frequently a major problem. See news item below.*)

*Farmers Fleeing Floods Near India's Capital

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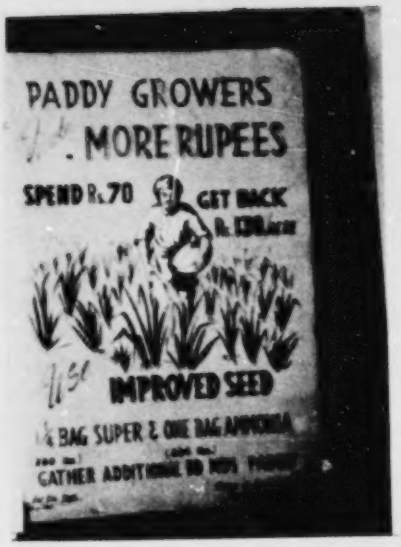
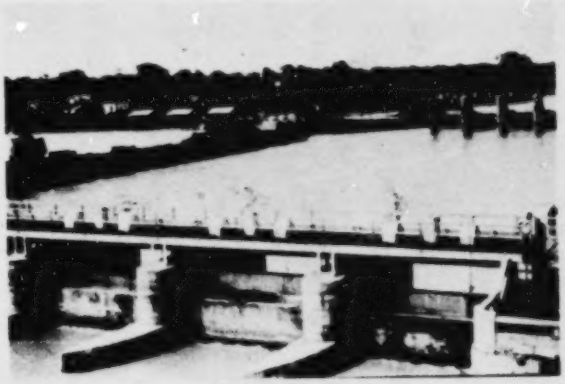
(NY Times - 8/10/77)

A major portion of the difficulty rests with the high-yield seeds themselves; they will outperform native varieties only under the most



[2] *An ad for high-yield rice seeds*

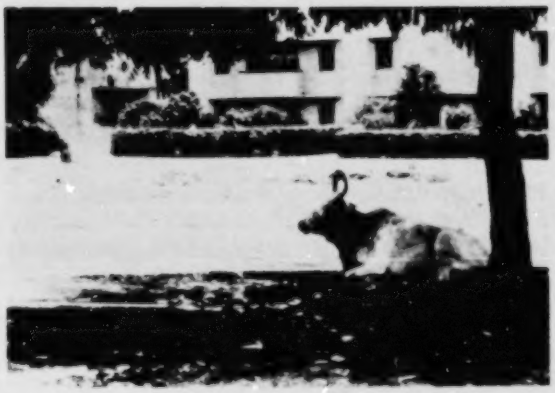


[3] *Flood control*

[4] *Village farmer*

favorable growing conditions. Regardless of weather, they require large inputs of fertilizer, pesticides (a disastrous upshot of the energy crisis has been a tremendous increase in the cost of these petroleum-based fertilizers and insecticides), and irrigation water. Thus, the problem is twofold; erratic, abnormal weather conditions cause disruption in terms of yield and the average under-educated farmer with his small acreage[4] has neither the credit to purchase, nor the knowledge to use, the required inputs for this type of agriculture. As a result, the "Green Revolution" has brought about drastic upheavals. The gap between wealthy and poor landowners continues to widen and widespread crop failures have forced thousands into tenancy wherein they provide a pool of cheap labor for the more affluent. Increasing numbers are leaving their villages to seek work in the major cities, a factor which intensifies the already disastrous overcrowding in urban areas.

A related paradox is that the extensive use of electrified tube wells for irrigation has distinctly lowered the water table in many areas. This in turn has lowered the output of hydroelectric power generation "needed to pump irrigation water out of the tube wells." Finally, there are India's 225,000 cows.[5] For cultural and religious reasons they may not be slaughtered to provide sorely-needed protein (although cultural factors would proscribe the use of this protein by a large part of the population). As a result, there is serious overgrazing which limits the animals' usefulness as milk producers and, not incidentally, inhibits the growth of forests. This latter effect has contributed to the critical scarcity of firewood. Another irony is that the necessary use of cow dung[6,7] as fuel, while seemingly a positive benefit of this situation, actually limits its use as manure which would increase crop yields.



[5] *One of 225,000*

[6] *Cow dung*

[7] *Making gas out of cow dung*

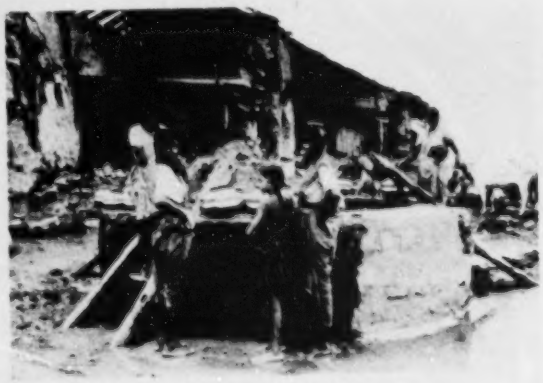
The most critical pollution problem in developing nations like India is the difficulty of providing an adequate supply of pure drinking water.[8] While treatment plants exist in most major cities,[9] the rapidly expanding squatter settlements and slum areas are bereft of such services. Contributing to the magnitude of the overall problem is the dispersal of most of the population in widely scattered small villages – a factor which makes centralized treatment systems economically unfeasible. On the other hand, attempts by public health workers to chlorinate individual wells[10] often meet with stiff resistance from villagers who object to the strange taste (as do many people in the United States) and do not understand the benefits. Complicating the general water problem is the fact of reduced supply during the dry season and the multiple demands made on rivers and ponds for washing, laundering,[11] ritual bathing,[12] and for the watering of animals.[13] All of this is, of course, in addition to any consideration of the deleterious effects of domestic[14,15] and industrial effluents on the water supply.

As in other developing nations, sewage treatment in India is given a low priority because of the prohibitive costs involved. Only a few hundred of India's more than two thousand cities have sewer systems, and nearly half of these systems are improperly maintained. Sanitation facilities are practically non-existent in urban slums and in villages.

A great number of Indian cities have "split personalities" – a modern growing section adjacent to the traditional "old city" which is badly congested and lacking in essential services. Slum clearance projects and new housing construction have made some inroads, but even if India had the capital resources to expand these efforts, it would be difficult to keep

[8] *Vending drinking water in New Delhi*

[9] *Water filtration in Baroda*



[10] *The village water supply*

up with the increased demands generated by rapid population growth.[16,17,18]

As in other developing countries, the disparity between the quality of education in public and private schools mirrors the economics of Indian society.[19] Public education, given the tremendous proportion of the population which is of school age, and India's birth rate raise even more problems in terms of the priorities which must be set by the nation.

PROBLEM FOR DISCUSSION

India is seeking to achieve land reform by limiting the size of individual holdings. The goal is to create a politically stable class of independent, small landowners. If food supplies are to keep pace with population growth however, India's agricultural system requires immediate modernization. This will entail the full realization of everything the "Green Revolution" promised, with its associated purchases of tractors, fertilizer, pesticides, and heavy dependence on irrigation systems, all of which are beyond the limited financial resources of the individual small farmer. How can this apparent conflict between reform (in terms of equity in landholding) and moderization (in terms of necessary capital input) be resolved?

QUESTIONS

- What is the relatinship between population growth and the ability of a developing nation like India to improve the material well-being of its citizens?
- Is the attainment of general living standards approaching that enjoyed by the middle class in the United States the

[11]*Laundry day*

[12]*Ritual bathing in the Ganges River*

[13]*Watering livestock*

ultimate goal of planners in developing countries? Should it be? Why or why not?

- China seems to have improved the living conditions of its people during the last 20 years. If this is a fair statement, does the Chinese "solution" appear to be applicable to India's problem?

- Make a list of the individual problems of human needs faced by India's population. Include all that occur to you as running the gamut from protein sufficiency to adequate housing and transportation. Rank these problems in order of importance or critical nature by conducting a random survey of segments of the school population.

- Define GNP and find out what India's is. Compare this with the total amount of money spent in the United States by the Federal Government for welfare, air and water quality, subsidized housing, and medical care. Express this total expenditure and India's GNP as a fraction. Even allowing for the standards an affluent society sets for itself and the relatively greater cost of these sources here, discuss how India can ever begin to provide similar "amenities" to its populace.

- Discuss Indian nationalism in terms of the country's stated social and economic goals. Specifically, what, if any, compromises in these goals must be made if the nation needs to defend its border and uphold and enhance its increasing stature among world nations?

[14] *Foam from nonbiodegradable detergents*

[15] *The culprit*

[16] *The Daravai slum Bombay*

RESOURCES

Borlaug, Norman E. "The Green Revolution for Bread and Peace," Bulletin of the Atomic Scientists, June, 1971, pp. 6-9, 42-48.

Dandekar, V. M., and Roth, N. Poverty in India. Bombay, India: Indian School of Political Economy, 1971.

The Difficult Years: The Farmer Faces the Energy Crisis. Albany, NY and New Delhi, India: Educational Resources Center, New York State Education Department, 1975.

An Environmental Syllabus, grades 10, 11, 12. Albany, NY: New York State Education Department, 1977, pp. 35-42.

The Giant and the Dwarf: India's Green Revolution Filmstrip. Culver City, CA: Social Studies School Service.

"Green Revolution," Nation, September 10, 1973.

Lowenberg, Marion E. Food and Man. New York: John Wiley and Sons, 1974.

Pimentel, D., et al. "Food Production and the Energy Crisis," Science, vol. 182, 1973, pp. 443-449.

"Running Out of Food," Newsweek, November 11, 1974, pp. 56-68.

Self-Study Guide on Urban Problems and Urbanism in South Asia. Albany, NY: New York State Education Department, and Syracuse, NY: Maxwell School, Syracuse University, 1974.

Singh, Tarlok. Poverty and Social Change. New Delhi, India: Orient Longman, 1975.

"World Food Crisis," Time, November 11, 1974, pp. 66-83.

[17] *"Temporary housing" in a drainage pipe*

[18] *Modern apartments in Ahmedabad*

[19] *A public school in Bombay*

APPENDIX A – STOCKHOLM CONFERENCE PREAMBLE

THE UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT

Having met at Stockholm from 5 to 16 June 1972, and
Having considered the need for a common outlook and for common principles to inspire and guide the peoples of the world in the preservation and enhancement of the human environment

PROCLAIMS THAT

1. Man is both creature and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social, and spiritual growth. In the long and tortuous evolution of the human race on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale. Both aspects of man's environment, the natural and the manmade are essential to his well-being and to the enjoyment of basic human rights – even the right to life itself.

2. The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the peoples of the whole world and the duty of all governments.

3. Man has constantly to sum up experience and go on discovering, inventing, creating, and advancing. In our time, man's capability to transform his surroundings, if used wisely, can bring to all peoples the benefits of development and the opportunity to enhance the quality of life. Wrongly or heedlessly applied, the same power can do incalculable harm to human beings and the human environment. We see around us growing evidence of manmade harm in many regions of the earth: dangerous levels of pollution in water, air, earth, and living beings; major and undesirable disturbances to the ecological balance of the biosphere; destruction and depletion of irreplaceable resources; and gross deficiences harmful to the physical, mental, and social health of man, in the manmade environment, particularly in the living and working environment.

4. In the developing countries most of the environmental problems are caused by underdevelopment. Millions continue to live far below the minimum levels required for a decent human existence, deprived of adequate food and clothing, shelter and education, health and sanitation. Therefore, the developing countries must direct their efforts to development, bearing in mind their priorities and the need to safeguard and improve the environment. For the same purpose, the industrialized countries should make efforts to reduce the gap between themselves and the developing countries. In the industrialized countries, environmental problems are generally related to industrialization and technological development.

5. The natural growth of population continuously presents problems for the preservation of the environment, and adequate policies and measures should be adopted, as appropriate, to face these problems. Of all things in the world, people are the most precious. It is the people that propel social progress, create social wealth, develop science and technology, and, through their hard work, continuously transform the human environment. Along with social progress and the advance of production, science and technology, the capability of man to improve the environment increases with each passing day.

6. A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well-being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes. There are broad vistas for the enhancement of environmental quality and the creation of a good life. What is needed is an enthusiastic but calm state of mind and intense but orderly work. For the purpose of attaining freedom in the world of nature, man must use knowledge to build, in collaboration with nature, a better environment. To defend and improve the human environment for present and future generations has become an imperative goal for mankind – a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and of worldwide economic and social development.

7. To achieve this environmental goal will demand the acceptance of responsibility by citizens and communities and by enterprises and institutions at every level, all sharing equitably in common efforts. Individuals in all walks of life as well as organizations in many fields, by their values and the sum of their actions, will shape the world environment of the future. Local and national governments will bear the greatest burden for large-scale environmental policy and action within their jurisdictions. International co-operation is also needed in order to raise resources to support the developing countries in carrying out their responsibilities in this field. A growing class of environmental problems, because they are regional or global in extent or because they affect the common international realm, will require extensive cooperation among nations and action by international organizations in the common interest. The conference calls upon governments and peoples to exert common efforts for the preservation and improvement of the human environment, for the benefit of all the people and for their posterity.

APPENDIX B – CONFERENCE DECLARATIONS

CONFERENCE DECLARATIONS

1. Man has the fundamental right to freedom, equality, and adequate conditions of life, in an environment of quality. Apartheid, racial segregation, discrimination, colonial and other forms of oppression, and foreign domination stand condemned and must be eliminated.
2. The natural resources of the earth including the air, water, land, flora and fauna, and, especially, representative samples of natural ecosystems must be safeguarded.
3. The capacity of the earth to produce vital renewable resources must be maintained, restored and improved.
4. Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat.
5. The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion.
6. The discharge of toxic substances and the release of heat in such quantities as to exceed the capacity of the environment to render them harmless must be halted.
7. States shall take all possible steps to prevent pollution of the seas.
8. Economic and social development is essential for ensuring a favorable living and working environment for man.
9. Environmental deficiences can best be remedied by accelerated development through the transfer of substantial quantities of financial and technological assistance.
10. For developing countries, stability of prices and adequate earnings are essential to environmental management.
11. The environmental policies of all States should enhance development potential of developing countries and steps should be taken to meet economic consequences resulting from the application of environmental measures.
12. Resources should be made available to preserve and improve the environment of developing countries by incorporating environmental safeguards into their planning.
13. States should adopt an integrated approach to their development planning.
14. Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and improve the environment.
15. Planning must be applied to human settlements, avoiding adverse effects on the environment and obtaining maximum social, economic, and environmental benefits for all.
16. Demographic policies should be applied to those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects on the environment or development.
17. National institutions must be entrusted with the task of planning, managing, or controlling the environmental resources of the nations.
18. Science and technology must be applied to the identification, avoidance, and control of environmental risks and the solution of environmental problems.

19. Education in environmental matters is essential to broaden the basis for an enlightened opinion and responsible conduct.

20. The free flow of up-to-date scientific information and experience must be supported and environmental technologies should be made available to developing countries.

21. States have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that these activities do not cause damage to the environment of other states.

22. States shall co-operate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage.

23. It will be essential to consider the systems of values prevailing in each country, and the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries.

24. International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing and in such a way that due account is taken of the sovereignty and interests of all states.

25. States shall ensure that international organizations play a role for the protection and improvement of the environment.

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1986	Kenneth B. Clark, A.B., M.S., Ph.D., LL.D., L.H.D., D.Sc.	Hastings on Hudson
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1988	Willard A. Genrich, LL.B., L.H.D., LL.D.	Buffalo
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1984	Jorge L. Batista, B.A., J.D., LL.D.	Bronx
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